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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/715,552 | 11/19/2003 | Jinlian Hu | 007198-556 | 5057 |
| 21839 | 7590 | 05/17/2006 | EXAMINER | |
| BUCHANAN INGERSOLL PC (INCLUDING BURNS, DOANE, SWECKER & MATHIS) POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404 | | | SERGEANT, RABON A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1711 | |

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,552

Applicant(s)

HU ET AL.

Examiner

Rabon Sergeant

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,7-13 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-13 and 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It cannot be determined if claim 13 further limits claim 1, in view of the amendment to claim 1 specifying that the diol and diisocyanate are mixed in the presence of not more than 30 weight percent of a water miscible solvent. The subject matter of previously examined claim 14 (the limitation now being present as an amendment to claim 1) was construed to mean that a solvent is definitively present in an amount up 30 weight percent; however, since applicants' dependent claim 13 (containing a limitation definitively excluding solvent) remains dependent on claim 1, the examiner now concludes, as a result of the amendment, that the amended language of claim 1 merely specifies that the solvent is an optional component.

2. Claims 1-3, 5, 7-13, and 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Adequate support has not been provided for the claimed weight percent basis for the water miscible solvent. Applicants' argument that support stems from the basis set forth for the separate and distinct water component is insufficient.

3. Claims 1-3, 5, 7-13, and 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled

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in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Within the previous Office action, it was stated that it is not seen how physical properties such as tensile modulus can be measured or even assumed to exist for liquid materials (those above the melting point). In response, applicants argued that the melting temperature is defined as the melting temperature of one of the blocks of a di-block shape memory polymer and supplied an article to that effect. However, applicants' specification, as filed, contains no disclosure that "melting temperature", should be so narrowly defined. There is no disclosure within applicants' specification that even remotely suggests that "melting temperature" refers to one block of a di-block polymer or that applicants' polyurethane constitutes a di-block polymer within the meaning of the cited article. In summation, there is nothing within the specification that would prompt one of ordinary skill to interpret "melting temperature" as argued.

4. Claims 1-3, 5, 7-13, and 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants have failed to provide enablement for polymers having melting temperatures over the disclosed and claimed range of -30 to 80°C. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Applicants' response that the range is merely a preferred range is not seen to be relevant to the issue at hand. The claims are clearly drawn to polyurethanes having a melting temperature over the argued range, and the position is maintained that applicants have failed to teach how to produce a polyurethane having a melting point as low as

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-30°C. The examiner takes the position that polyurethanes having such low melting temperatures are by no means conventional, and it is not apparent from applicants' specification how such a polyurethane can be produced. The position is further taken that in order to obtain such an unconventional polyurethane, unique processing and reaction conditions would be required; however, such conditions have not been recited by applicants.

5. Claims 1-3, 5, 7-13, and 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants have failed to provide enablement for reaction systems wherein the chain extender lacks a carboxylic acid group. It is clear from applicants' disclosure that the purpose of the neutralizer is to convert the carboxylic acid group into an anionic group, and this is the only function that the neutralizer would perform in the context of the invention; however, applicants' claims are not so limited. The neutralizer is not seen to have any material effect on a chain extender that lacks the carboxylic acid group. Applicants' response is not seen to have anything to do with the neutralizer; applicants' arguments are concerned only with the chain extender. The basis for the examiner's position concerning the neutralizer is set forth within lines 8-21 of page 6 of the specification, yet applicants' response in no way addresses this passage. In summation, applicants' response in no way addresses the issue raised by the examiner, and applicants' statement concerning the function of the neutralizer does not correlate to applicants' own disclosure.

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Furthermore, applicants have failed to provide adequate enablement for the production of polyurethanes having the properties set forth within claims 19-22. Applicants' specification provides no clear teachings with respect to the ratio of reactants, the selection of appropriate reactants, or other conditions that must be adhered to in order to obtain polyurethanes having the claimed properties. One could not practice the invention without resorting to undue experimentation. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Applicants' response in no way clarifies how polyurethanes having the claimed properties would result from following the teachings of the specification, given that applicants' react conventional reactants using conventional processing techniques that would be expected to yield a conventional polyurethane.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 5, 7-12, and 16-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramanathan et al. ('213).

Patentees disclose the production of polyurethane aqueous dispersions, wherein a prepolymer is produced in the presence of solvent from diisocyanates, polyols and chain extenders that correspond to applicants' claimed components. After formation of the prepolymer, the acid groups resulting from incorporation of the chain extender are neutralized with an amine, such as triethylamine. The neutralized prepolymer is then dispersed in water and the solvent is removed. This disclosure satisfies applicants' steps d) through f). Furthermore,

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applicants' claimed ratios and reaction conditions are disclosed within the reference. See column 2, lines 45+ and columns 3-5. Patentees teach at column 5, lines 14-16 that the diisocyanate, polyol, and chain extender may be reacted sequentially to form block copolymers; therefore, patentees are considered to adequately disclose applicants' steps a) through c). Furthermore, since the disclosed polyurethanes are produced from reactants that meet those claimed, applicants' claimed physical properties are considered to be inherently possessed by the disclosed polyurethanes.

8. Despite applicants' remarks, no distinction is seen to exist to distinguish the instantly claimed subject matter from Ramanathan et al.

9. Claims 1-3, 5, 7-13, and 16-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Klauck et al. ('433).

Patentees disclose the production of polyurethane aqueous dispersions, wherein a solventless prepolymer is produced from diisocyanates, polyols and chain extenders that correspond to applicants' claimed components. After formation of the prepolymer, the acid groups resulting from incorporation of the chain extender are neutralized with an amine. The neutralized prepolymer is then dispersed in water. Furthermore, applicants' claimed ratios and reaction conditions are disclosed within the reference. See abstract and columns 3-10.

Furthermore, since the disclosed polyurethanes are produced from reactants that meet those claimed, applicants' claimed physical properties are considered to be inherently possessed by the disclosed polyurethanes. As aforementioned within paragraph 1, applicants' amendment has altered the scope, meaning, and interpretation of the claims, such that the water miscible solvent is now seen to be an optional component. Accordingly, the solvent removal step is additionally

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considered to be optional when solvent is not employed, as in the case of claim 13. Accordingly, the limitation of claim 16 is met by the disclosure at column 9, lines 13-17, and the limitation of claim 17 is met by the fact that patentees disclose general processing temperature conditions that overlap the claimed water temperature.

10. Applicants have argued that tetramethyl xylene diisocyanate is excluded from the claims; however, this statement is incorrect. Applicants' claims allow for aliphatic diisocyanates and tetramethyl xylene diisocyanate is recognized within the art as being an aliphatic diisocyanate, due to the fact that the isocyanate groups are attached to aliphatic carbon atoms. Applicants' attention is directed to the following documents to support the examiner's position: American Cyanamid Co. MSDS Safety Information; PEP Review 83-2-4 (Tetramethylxylene Diisocyanate by American Cyanamid Technology); "Other Publications" cited on U.S. Patents 5,985,986 and 6,350,811; column 3, lines 57-62 of U.S. Patent 6,362,273; and column 12, lines 50-55 of U.S. Patent 6,734,251.

11. Contrary to applicants' arguments, applicants have not established that processes and compositions commensurate in scope with the claims possess patentable distinction relative to the prior art.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (571) 272-1079.

R. Sergent
May 12, 2006


RABON SERGENT
PRIMARY EXAMINER